

## REMARKS

### Claim Amendments

Independent claims 1, 27, 28, 30, and 31 have been amended to delete “sulfate” from the list of anionic moieties associated with the intercalant.

Claim 5 has been rewritten in independent form to include all the limitations of claim 1 as presented in Applicants’ 8/7/2006 Amendment.

Claim 23 has been amended to correct the misspelling of “trimethoxysilane”. Support for this correction may be found in paragraph [0066] of the application as filed.

### Obviousness Rejection over Yeager WO + Ross + Tsai

Claims 1-4, 6-25, 27-31, and 34 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over International Publication No. WO 01/40354 A1 of Yeager (“Yeager WO”) in view of U.S. Patent No. 6,521,690 to Ross et al. (“Ross”) and the evidence given in U.S. Patent No. 6,562,891 B1 to Tsai et al. (“Tsai”). 10/19/2006 Office Action, page 3, paragraph no. 3. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Yeager WO generally describes a resin composition formed from (1) a reactively endcapped poly(phenylene ether) compound and (2) a curable unsaturated monomer composition. Yeager WO abstract. As acknowledged by the Examiner,

[Yeager WO] does not [teach] that the filler is limited to montmorillonite, nontronite, beidellite, volkonskoite, hectorite, saponite, magadiite, and kenyaite and must have no linear dimension greater than 100 nm, and that the nanofiller is intercalated, nor discloses specific mixing steps in making the composition.

10/19/2006 Office Action, paragraph bridging pages 3 and 4.

Ross generally describes a composition consisting of an organic chemical/smectite clay intercalate that has been ion-exchanged and reacted and intercalated with one or more quaternary ammonium compounds and an anionic material

and further blended into a polymer resin to make a nanocomposite composition. Ross abstract. Suitable smectite clays include, inter alia, sodium montmorillonite, hectorite, saponite, and beidellite. Ross, col. 5, lines 40-45. The “anionic material” associated with the “quaternary ammonium compound” is “selected from the group consisting of chloride, methyl sulfate, acetate, iodide and bromide”. Ross, col. 6, line 64 to col. 7, line 24.

Tsai generally describes a modified clay mineral comprising a layered clay mineral intercalated with a catalyst that can catalyze a polymerization reaction. Tsai abstract. Tsai has apparently been cited for its statement, “Nanocomposites are a new class of minerals that exhibit ultrafine phase dimensions, typically in the range 1-100 nm.” Tsai, col. 1, lines 15-16.

Applicants respectfully assert that their independent claims 1, 27, 28, 30, and 31 are patentable over the combination of Yeager WO, Ross, and Tsai because a prima facie case of obviousness based on those structures has not been established. Specifically, the cited references fail to teach or suggest Applicants’ claimed intercalant structure.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a prima facie case of obviousness requires that all limitations of the claim be taught or suggested by the prior art. *See, e.g.*, MPEP 2143.03; *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003); *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974).

Applicants’ independent claims 1, 27, 28, 30, and 31 each recite “an intercalant selected from the group consisting of water-soluble polymers, amphoteric surface-active agents comprising an aliphatic amine cationic moiety and a sulfonate or phosphate anionic moiety, choline compounds, organosilane compounds, and mixtures thereof”. The Examiner appears to be relying on the intercalant teachings of Ross: “The intercalating agent is given in the formula in column 7. The anion is disclosed as a chloride, methyl sulfate, or others (col 7, lines 1-24).” 10/19/2006 Office Action, page 4, first full paragraph. While the cited section of Ross does teach a quaternary ammonium

compound, it does not teach “a sulfonate or phosphate anionic moiety” as required by Applicants’ independent claims. Accordingly, a prima facie case of obviousness against those independent claims has not been established.

Given that claims 2-4, 6-25, 29, and 34 each depend ultimately from and further limit independent claim 1 or independent claim 28, they too are patentable over the combination of Yeager WO, Ross, and Tsai. Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 1-4, 6-25, 27-31, and 34 under 35 U.S.C. § 103(a) over Yeager WO, Ross, and Tsai.

#### Obviousness Rejection over Yeager WO + Ross + Yeager ‘637

Claim 33 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Yeager WO in view of Ross and further in view of U.S. Patent No. 6,905,637 to Yeager et al. (“Yeager ‘637”). 10/19/2006 Office Action, page 5, paragraph no. 4. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Yeager WO and Ross are described above.

Yeager ‘637 generally describes a conductive thermosetting composition comprising a functionalized poly(arylene ether), and alkenyl aromatic monomer, an acryloyl monomer, and a conductive agent. Yeager abstract. Yeager is cited for its teaching of “fillers such as silica, alumina, wollastonite (col 18, lines 3-37) . . . [and mixing] with a mixing energy of less than 50 kj/l (col. 24, lines 22-25).” 10/19/2006 Office Action, page 5, last paragraph.

Claim 33 depends directly from independent claim 31. As noted above, a prima facie case of obviousness based on Yeager WO, Ross, and Tsai has not been established against claim 31. A fortiori, a prima facie case based on Yeager WO and Ross (without Tsai) also has not been established. Adding Yeager ‘637 does not change this conclusion. Specifically, Yeager ‘637 does not teach “an intercalant selected from the group consisting of water-soluble polymers, amphoteric surface-active agents comprising an aliphatic amine cationic moiety and a sulfonate or phosphate anionic moiety, choline

compounds, organosilane compounds, and mixtures thereof” as recited in claim 31.

Thus, a prima facie case of obviousness against claim 31 has not been established based on Yeager WO, Ross, and Yeager ‘637. Because claim 33 depends directly from and further limits claim 31, it too is patentable over the cited references. Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claim 33 under 35 U.S.C. § 103(a) over Yeager WO, Ross, and Yeager ‘637.

#### Obviousness Rejection over Yeager WO + Ross + Merfeld

Claim 26 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Yeager WO in view of Ross and further in view of U.S. Patent No. 6,878,782 to Merfeld et al. (“Merfeld”). 10/19/2006 Office Action, page 6, paragraph no. 5. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Yeager WO and Ross are described above.

Merfeld generally describes a curable composition includes a functionalized poly(arylene ether); an alkenyl aromatic monomer; an acryloyl monomer; and a polymeric additive having a glass transition temperature less than or equal to 100°C and a Young's modulus less than or equal to 1000 megapascals at 25°C. Merfeld abstract.

Claim 26 depends directly from claim 1. As noted above, a prima facie case of obviousness based on Yeager WO, Ross, and Tsai has not been established against claim 1. A fortiori, a prima facie case based on Yeager WO and Ross (without Tsai) also has not been established. Adding Merfeld does not change this conclusion. Specifically, Merfeld does not teach “an intercalant selected from the group consisting of water-soluble polymers, amphoteric surface-active agents comprising an aliphatic amine cationic moiety and a sulfonate or phosphate anionic moiety, choline compounds, organosilane compounds, and mixtures thereof” as recited in claim 1. Thus, a prima facie case of obviousness against claim 1 has not been established based on Yeager WO, Ross, and Merfeld. Because claim 26 depends directly from and further limits claim 1, it too is patentable over the cited references. Applicants therefore respectfully request the

reconsideration and withdrawal of the rejection of claim 26 under 35 U.S.C. § 103(a) over Yeager WO, Ross, and Merfeld.

Allowable Subject Matter


Claim 5 was objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form. Claim 5 is currently amended to rewrite it in independent form to include all the limitations of claim 1 as presented in Applicants' August 7, 2006 amendment.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-1131 maintained by Assignee.

Respectfully submitted,

CANTOR COLBURN LLP  
Applicants' Attorneys

By:   
J. Michael Buchanan  
Registration No. 44,571

Date: November 7, 2006  
Customer No.: 23413  
Telephone: (860) 286-2929